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(54) ALKYD RESIN-MODIFIED DISPERSIONS

(71) We, FARBWERKE HOECHST AKTIENGESELLSCHAFT, vormals Meister Lucius & Brüning, a body corporate recognised under German law, of 6230 Frankfurt/Main 5 80, Federal Republic of Germany, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and 10 by the following statement:—

This invention relates to alkyd resin-modified dispersions which are especially suitable for the preparation of elastic paints and armouring adhesives.

15 Several processes have been proposed to incorporate alkyd resins into aqueous paint systems. British Patent No. 1,151,727, for example, describes the addition of an alkyd resin dissolved in an organic solvent 20 to a pigment paste which is then incorporated into an aqueous plastics dispersion. A publication made by Messrs. Goodrich Chem. Comp. in Journal of Paint Technology No. 508, May 1967, Pages 25 300 — 308 comments on alkyd resin additions to aqueous dispersion paints based on vinyl chloride/acrylate and vinyl acetate co-polymer dispersions, according to which the alkyd resin is incorporated 30 into a pigment paste containing non-ionic wetting agents, cellulose derivatives, solvents and polyphosphates. In another working procedure, the alkyd resin-containing pigment paste is added to the above mentioned aqueous plastics dispersions.

35 The present invention provides an alkyd resin-modified dispersion derived from 100 parts by weight of an aqueous dispersion of

40 (a) a copolymer of vinyl acetate and a vinyl ester of a branched monocarboxylic acid, and/or
 (b) a copolymer of vinyl acetate, a vinyl ester of a branched monocarboxylic acid and an acrylic acid ester, and/or

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(c) a copolymer of vinyl acetate and a maleic acid ester having a solids content of from 45 to 60%, and from 25 to 10 parts by weight of an alkyd resin emulsion, the weight ratio of 50 solid plastics polymer to solid alkyd resin being from 75 : 25 to 90 : 10, together with a stabilizer.

The advantage of the dispersion according to the present invention over the products prepared in accordance with the preceding processes resides in the fact that the alkyd resin is present in the finished dispersion in emulsified form. By the selection of a specific alkyd resin and due 60 to a special mixing ratio between dispersion and alkyd resin and a corresponding emulsifier system, alkyd resin-modified dispersions are obtained having a shelf life of several months. The alkyd resin is 65 added in emulsified form so that the resin can be incorporated into the additionally stabilized aqueous plastics dispersion without prior dissolution in solvents.

The dispersion obtained according to the 70 present invention can be used for the preparation of paints and armouring adhesives and may be applied as elastic paint layers on many different surfaces such as wood, concrete, asbestos-cement and masonry.

Owing to its good adhesion the dispersion 75 is suitable for preparing primer coatings and paints for the restoration or consolidation of old, chalking and porous surfaces.

Wet adhesion is improved when applying paints prepared from the dispersion according to the present invention in determined pigmentation ranges on old surfaces coated with alkyd resin paints. In the case of high-pigmented paints the portion 80 of alkyd resin contained in the dispersion ensures a higher fastness to wet abrasion. Moreover, the paints obtained with the alkyd resin-modified dispersion can be easily spread and impart to the colour a 85 90

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varnish-like appearance.

The high film elasticity of the dispersion according to the present invention in pigmented or unpigmented state offers the 5 possibility of preparing smooth reinforcements to cover shrinkage and settling cracks in concrete, plaster and masonry. Dried dispersion films having a thickness of 0.5 mm show an elongation of about 10 2000% (elongation at break according to DIN 53 371). The elongation at break of pigmented, dried films (pigment/filler ratio 1 : 1, based on the solids content of the dispersion) is approximately 1000%. Comparative conventional dispersion systems show a lower elasticity with the same pigmentation ratio. The addition of the alkyd resin causes the formation of an adhesion bridge to the treated surface. Moreover, due 15 to the high inherent elongation of the adhesive an interposed elastic fabric is supported by this adhesive so that the occurring forces are evenly distributed over the whole surface. All tensile and strain stresses 20 are thus uniformly absorbed and are not transmitted to the top coating, thereby reducing the susceptibility to form cracks.

The preparation of the alkyd-resin-modified dispersions according to the present invention is advantageously carried out in such a way that 100 parts by weight of the aqueous plastics dispersion (solid content 30 45 to 60%) are placed in a vessel and mixed while stirring with about 0.1 part by 35 weight of a suitable defoamer and from 20 to 8 parts by weight of a stabilizer, for example a 5 to 2% high-viscosity and/or low-viscosity hydroxyethyl cellulose solution in water (Hoppler viscosity of the 2% 40 hydroxyethyl cellulose solution 1000 to 10000 cP). 25 to 10 parts by weight of an alkyd resin emulsion are subsequently added while the stirrer is running slowly. After stirring for 10 minutes mixing is 45 terminated. The weight ratio solid plastics polymer: alkyd resin (solid) is in the range of from 75 : 25 to 90 : 10 according to the mixing ratio.

To prepare the alkyd resin emulsion, for 50 example, from 10 to 40 parts by weight of water, from 0.5 to 2 parts by weight of ammonia (concentrated) and from 1 to 3 parts by weight of a water-soluble, surface-active substance (polyglycol ether having 55 a degree of oxethylation of from 4 to 30) are introduced in a vessel and 70 parts by weight of a long oil alkyd resin are emulsified therein. Any long oil alkyd resins may be employed, preferably Safflower alkyd 60 resin (from safflower oil), soya or linseed oil alkyd resin. With a resin content of 100% Safflower alkyd resin is low-viscous (20 to 250 cP, 20°C; determined by a Hoppler viscometer) and is capable of being 65 stirred into the dispersion in emulsified

form without having been dissolved in an organic solvent. This resin represents a super fat alkyd resin having an acid content of more than 80% and is resistant to yellowing. As described above, optimum 70 emulsification of the alkyd resin can be obtained with a combination of ammonia and surface-active substances. The addition of hydroxyethyl cellulose brings about an additional stabilization of the dispersion. 75

The dispersion of the present invention can be used to prepare dispersion paints for wood, masonry, concrete, asbestos-cement, old paint coatings and interiors. For these dispersion paints the weight ratio 80 of pigment and filler to binder is advantageously between 0.6 : 1 and 9 : 1. For the preparation of the paints there may be used, besides the customary fillers and pigments, thickeners, wetting agents, de- 85 foamers, preservatives, and solvents, for example, mineral spirit, spirits of turpentine, and butyldiglycol acetate as film consolidating agent. Since the dispersion requires a low minimum film-forming tem- 90 perature, it is sufficient to add from 1 to 3% of a solvent based on the dispersion paint. An addition of from 0.5 to 1% of a paint drier is preferably added in order to ensure a more rapid drying of the paints. 95

The following Examples illustrate the invention.

EXAMPLE 1: An alkyd resin modified dispersion was prepared in the manner described above from:

100.0 parts by weight of a dispersion of a copolymer of vinyl acetate and Versatic (registered Trade Mark) acid vinyl ester (esters of long chain branched dicarboxylic acids, producer: 105 Shell Chemie)

0.1 part by weight of a defoamer (Nopco (registered Trade Mark) NXZ by Nopco Chem. Co., Harrison N.J., USA)

8.0 parts by weight of a 2% solution of Natrosol (registered Trade Mark) 250 H (hydroxyethyl cellulose)

18.0 parts by weight of an alkyd resin emulsion of 70% strength (terephthalic acid-soya alkyd resin)

Ratio emulsion polymer: alkyd resin (solid) 80 : 20

EXAMPLE 2: An alkyd resin modified dispersion was prepared in the manner 120 described above from:

100 parts by weight of vinyl acetate/Versatic acid vinyl ester copolymer dispersion

0.1 part by weight of a defoamer (Nopco NXZ)

8.0 parts by weight of a 2% solution of Natrosol 250 H

12.8 parts by weight of an alkyd resin emulsion of 70% strength (terephthalic 130

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acid — soya alkyd resin)
Ratio emulsion polymer: alkyd resin
(solid) 85 : 15

WHAT WE CLAIM IS:—

- 5 1. An alkyd resin-modified dispersion derived from 100 parts by weight of an aqueous dispersion of
 - (a) a copolymer of vinyl acetate and a vinyl ester of a branched monocarboxylic acid, and/or
 - (b) a copolymer of vinyl acetate, a vinyl ester of a branched monocarboxylic acid and an acrylic acid ester, and/or
 - (c) a copolymer of vinyl acetate and a maleic acid ester10 having a solids content of from 45 to 60%, and from 25 to 10 parts by weight of an alkyd resin emulsion, the weight ratio of said plastics polymer to solid alkyd resin being from 75 : 25 to 90 : 10, together with a stabilizer.
- 15 2. An alkyd resin-modified dispersion according to claim 1, wherein the stabilizer is a 5 to 2% high-and/or low-viscosity hydroxyethyl cellulose aqueous solution which is present in an amount of from 8 to 20 parts by weight.
- 20 3. An alkyd resin-modified dispersion according to claim 1 or claim 2, and containing about 0.1 part by weight of a de-foamer.
- 25 4. An alkyd-resin modified dispersion according to any one of claims 1 to 3, wherein the alkyd resin emulsion is prepared from 70 parts by weight of a long oil alkyd resin having fatty acid content of more than 80%, from 10 to 40 parts by weight of water and a combination of from 0.5 to 2 parts by weight of concentrated ammonia and from 1 to 3 parts by weight of a water soluble, surface-active substance, preferably a polyglycol ether having a degree of oxethylation of from 4 to 30.
- 30 5. An alkyd resin-modified dispersion as claimed in claim 1, substantially as described in the Examples herein.
- 35 6. An elastic paint or adhesive containing an alkyd resin-modified dispersion as claimed in any one of claims 1 to 5.

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